Supporting information

Tables

Table S1: Model 1: Raced (0/1) ~ Froh + sex + (1|birth_year). Model estimates for a binomial mixed model for the response variable "raced" (0/1 for whether a horses has ever raced).

term	estimate (log-OR)	CI (2.5%)	CI (97.5%)	z-value	p-value	Info
Intercept	1.021	-1.316	3.358	0.856	0.392	
Fixed effects						
F_{ROH}	2.776	-5.642	11.194	0.646	0.518	continuous
Sex	0.181	-0.301	0.663	0.735	0.462	categorical (0=female, 1=male)
Random effects (standard deviation)						
Birth year	0.558					n = 9

Table S2: Model 2: Raced (0/1) ~ FrohLong + FrohShort + sex + (1|birth_year). Model estimates for a binomial mixed model for the response variable "raced" (0/1 for whether a horses has ever raced for $F_{ROHlong}$ and $F_{ROHshort}$.

term	estimate (log-OR)	CI (2.5%)	CI (97.5%)	z-value	p-value	Info
Intercept	2.103	-0.93	5.137	1.359	0.174	
Fixed effects						
$F_{ROHlong}$	3.611	-4.944	12.166	0.827	0.408	continuous
$F_{ROHshort}$	-2.954	-16.184	10.275	-0.438	0.662	continuous
Sex	0.179	-0.303	0.661	0.729	0.466	categorical (0=female, 1=male)
Random effects (standard deviation)						
Birth year	0.552					n = 9

Table S3: Model 3: Races (> 0) ~ FrohLong + FrohShort + sex + (1|birth_year) + (1|olre). Model estimates for a Poisson mixed model with the response variable 'races' (number of races), for horses that had at least one racecourse start.

term	estimate (log-OR)	CI (2.5%)	CI (97.5%)	z-value	p-value	Info
Intercept	3.491	2.625	4.356	7.902	0	
Fixed effects						
$F_{ROHlong}$	-3.664	-6.143	-1.184	-2.896	0.004	continuous
$F_{ROHshort}$	-5.025	-8.852	-1.198	-2.574	0.01	continuous
Sex	0.387	0.247	0.528	5.394	0	categorical (0=female, 1=male)
Random effects (standard deviation)						
Observation-level random effect	0.676					n = 768
Birth year	0.137					n = 9

Table S4: Predicted number of races for horses with varying inbreeding coefficients F_{ROH} relative to the average inbreeding coefficient.

F_{ROH}	Relative	Predicted number of races	CI (2.5%)	CI (97.5%)
0.18	-10%	16.026	12.399	20.715
0.23	-5%	13.201	11.263	15.473
0.28	mean	10.874	9.668	12.23
0.33	+5%	8.957	7.498	10.7
0.38	+10%	7.378	5.574	9.766

Figures

Figure S1: F_{ROH} distribution among North American horses

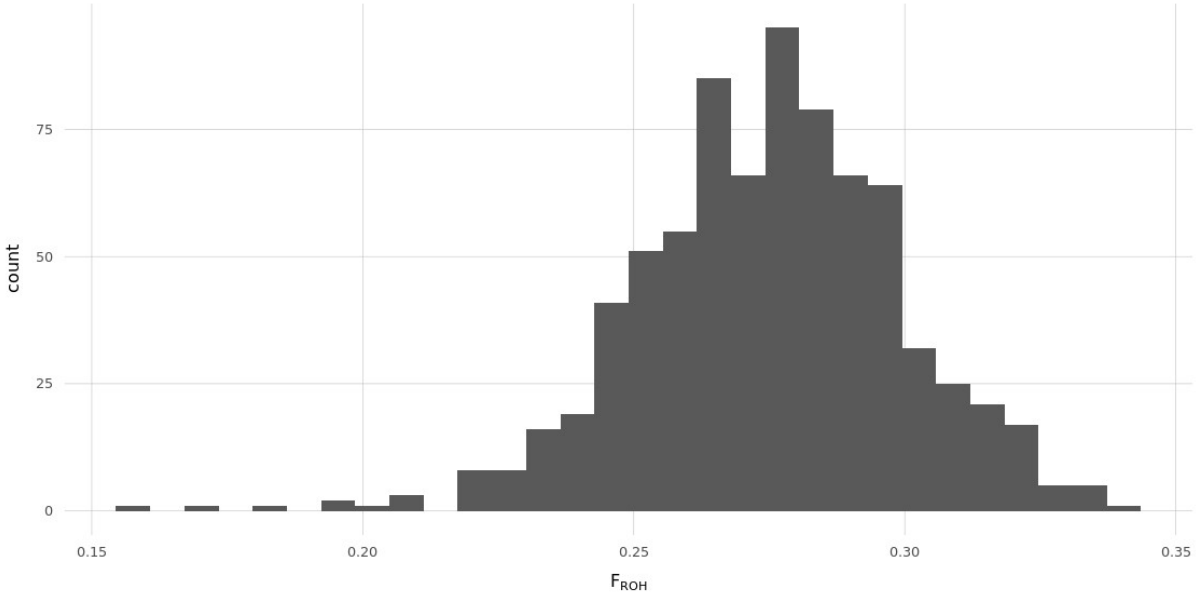

Fig. S2: Principal component analysis plots. Plots showing 6,128 horses from Europe (EU) and Australasia (AusNZ) (Hill *et al.* 2022) and the 768 North American (Nam) horses used in this study along the three first principal components (PC1 *vs* PC2, top; PC2 *vs* Pc3, bottom) with region of origin for each horse colour-coded.

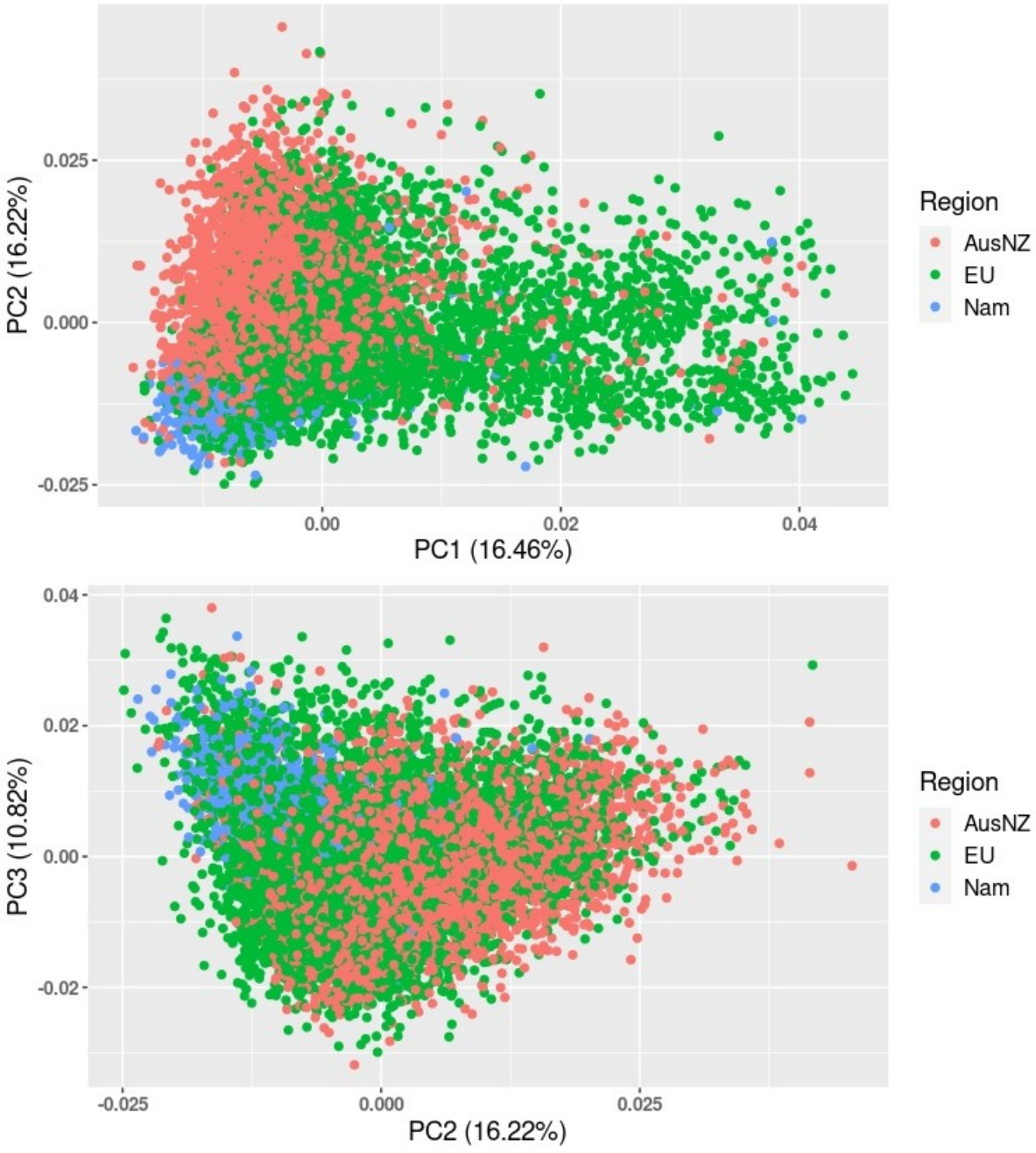

Fig. S3: Model 1: Raced (0/1) ~ froh + sex + (1|birth_year). As shown in Table S1, there is no association between inbreeding and probability of racing. The plot shows predicted probability (and 95% confidence intervals) of racing for different inbreeding coefficients (F_{ROH}) alongside raw data (horses that have raced at 1 and those that have not raced at 0). As shown in Table S1, there is no association between inbreeding and probability of racing.

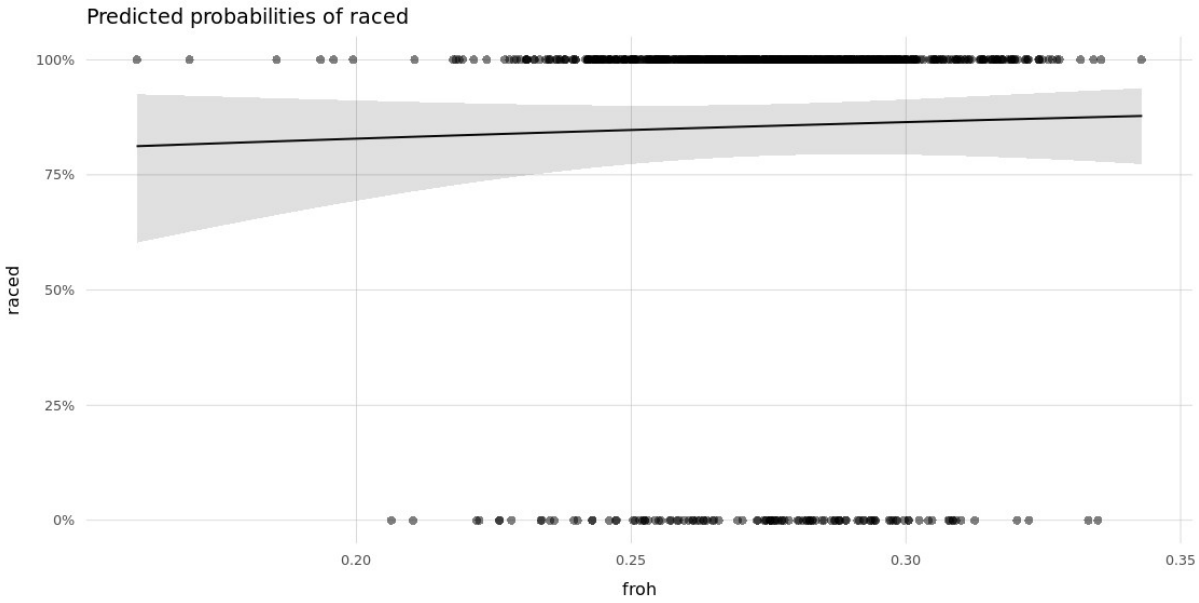

Fig. S4: Model 2: Raced (0/1) ~ FrohLong + FrohShort + sex + (1| birth_year). The plots show predicted probability (and 95% confidence intervals) of racing for different inbreeding coefficients ($F_{ROHlong}$ on the left and $F_{ROHshort}$ on the right) alongside raw data (horses that have raced at 1 and those that have not raced at 0).

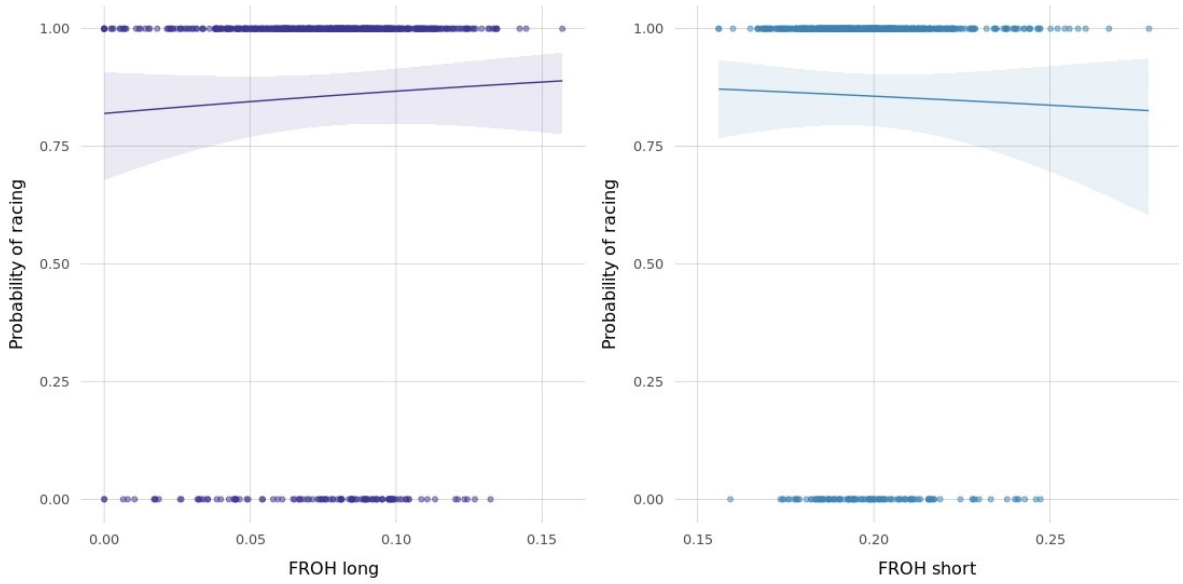

Fig. S5: Predicted counts of race starts for different inbreeding coefficients F_{ROH} using the model: races (> 0) ~ Froh + sex + (1| birth year) + (1|olre). Individual horses are colour coded by year of birth and shapes indicate sex of the animal (F – female, M – male).

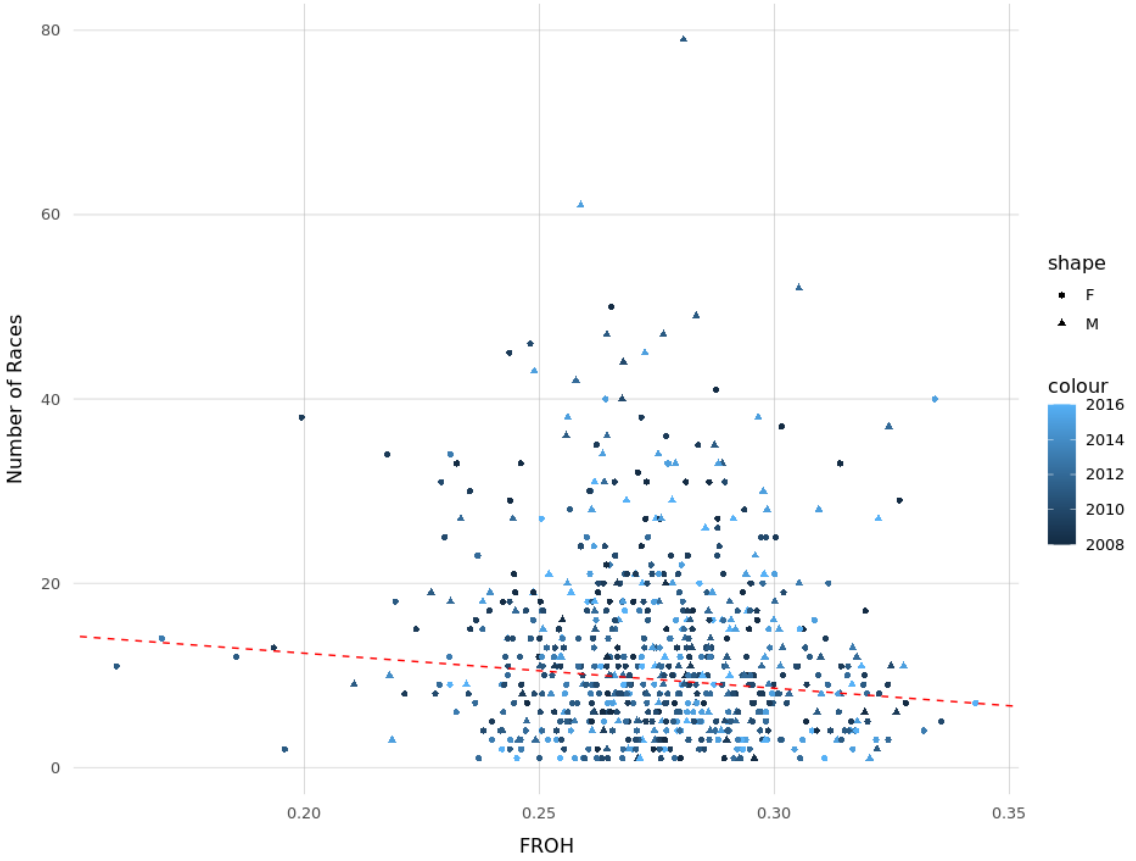

Fig. S6: Model 3: Races (> 0) ~ FrohLong + FrohShort + sex + (1|birth_year) + (1|olre). Poisson model for number of races among horses that raced for different inbreeding coefficients (*F*ROHlong on the left and *F*ROHshort on the right). Plots show the same prediction lines with and without raw data plotted on top.